

GEOLOGY 102 HISTORICAL GEOLOGY

Catalog Description: GEOL 102. Historical Geology. 3-3-0. A survey of the origin and development of life on earth as revealed by the fossil record (40.0601).

Prerequisites: GEOL 101, Physical Geology.

Required Text and Other Materials: Levin, H. 2006. *The Earth Through Time*, 8th Edition, Wiley.

Student Outcome Objectives: The student must demonstrate an understanding

of the following subjects:

- a) The basis of scientific theory and the scientific method, the 3 basic rock groups and the rock cycle, composition and physical structure of the earth, plate tectonics.
- b) Relative and absolute dating, geologic time, principles of Steno, radioactive decay, neptunism, catastrophism, uniformitarianism.
- c) Facies, stratigraphic relationships, transgression and regression, process of fossilization.
- d) Environments of deposition, paleogeographic reconstruction and paleoclimatic inferences.
- e) Darwin's and Wallace's theory of natural selection, Mendelian concept of inheritance, speciation, fossil record evidence.
- f) Continental drift, seafloor spreading, plate boundaries, driving mechanism for plate tectonics, mountain building.
- g) "Big Bang" theory, evolution of the earth, types of meteorites, origin of the earth and moon.
- h) Precambrian history, Archean eon, greenstone belts, origin and evolution of the atmosphere and oceans, fossil record and Archean ore deposits.
- i) Proterozoic eon, ophiolites, glacial deposits, banded iron formations, first appearance eukaryotes, multicellular life.
- j) Paleozoic era, major cratonic sequences, Appalachian mobile belt, reef development.
- k) Paleozoic life, Burgess Shale, marine food web, Permian extinction, evolutionary history of invertebrates, vertebrates, and plants.
- l) Mesozoic era and breakup of Pangaea, changes in life forms, Cretaceous extinction.
- m) Cenozoic era life, diversification of mammals.

Learning Strategy

I strongly encourage you to (a) attend **every** class and take notes, (b) keep up with the reading, and (c) ask questions in class if you wish to (your classmates will appreciate this), (d) see me after class or come to my office hours (that's what they are for) if you have further questions.

The goals of this course is to **Understand** the material and **NOT only to Memorize Facts!!**

To help with the note-taking process, I will make a "template" of each chapter's lecture notes available for students to print and bring to class. **I will not post the full lectures notes online, nor will I give them out to students by request.** Therefore, you must attend class and take notes if you wish to have all the material for the exams covered. If you miss a class, you will need to get the notes from a classmate, not from me! All of the exam questions will be drawn directly from material presented in lectures and textbook; thus, the note "templates" can serve as a very useful study guide for each of the exams.

So that all students can benefit from the lecture, I ask that you observe a few simple rules. Try your best to be on time, but if you are late, tiptoe in. If you absolutely, positively must leave early, please quietly tiptoe out without disturbing your fellow students. Please turn off cell phones, iPods, and other electronic devices. You may use your laptop during the class exclusively for subjects related to the class.

Course Requirements and Methods of Evaluation: Students will be evaluated on the basis of 5 examinations, four mid-term tests and a final examination worth 20% each. Test dates are provided in the schedule below. The format for the tests and exams is multiple choice and true/false questions (I reserve the right to decide to keep or not this format in an event of a make up test). Exam material is from lecture notes AND textbook. You will need a scantron sheet for each exam. The final exam will not be cumulative; instead, the material covered in the examinations will be spaced throughout the semester.

The final grade will be determined on a ten point scale (90-100%A; 80-89%B; 70-79%C; 60-69%D; below 60%F). Only the final course grades will be curved. Students should keep in mind that grading is an assessment of quality, not a measure of effort. Please do not interpret my attempt to make the classroom environment friendly and welcoming as any indication of relaxed academic expectations. On the contrary, you should expect a rigorous learning experience, and I will set a high academic standard for the class. Extra credits will absolutely not be given by request of any kind. I reserve the right to conduct or not extra credit activities during the course. Extra credit activities will not be made up in any circumstance, no exceptions!

Make-up Procedure: Make-up exams will only be allowed in cases where a test was missed for a valid and documented reason (medical condition, bereavement, travel for an athletic event or other university business). Mark test dates on your calendar now!! If you miss a test and you have a valid excuse, you must notify me by e-mail or telephone **before the exam begins** or, when that is logistically impossible, very soon afterwards **on the same day**. Use the same study guide, notes, and text readings as the regular exam to study for any make up exam. **Conflicts with jobs, other classes, and your personal life are not satisfactory excuses.** Personal travel is **not**, in any circumstance, a legitimate excuse. Please plan to be in attendance for each exam, including the last exam which will be given during the official university final exam period. Students requiring specialized classroom or test-taking accommodations should make arrangements with the Office of Disability Services or Dyslexia Center.

FINAL EXAM MAKE UP POLICY

There will be no early or late finals administered. There are no exceptions to this rule! If you miss the final exam, (1) provide me with a valid excuse within one day of missing the exam and (2) are passing the course at the time of the final, you will be given a grade of "I" (Incomplete) for the course. If you fail in either of these simple tasks, your grade will be based upon your total exam scores taken before the final plus a ZERO for the final exam.

Course Content:

Lect	DATE	LECTURE TITLE	Levin, H. 2006 TEXT (8 th Edition)
1	Jan 21	Introduction	
2	23	The Science of Historical Geology	Chapter 1: 1 - 9
3	26	Early Geologists Tackle History s Mysteries	Chapter 2: 11 - 25
4	28	Time and Geology	Chapter 3: 27 - 45
5	30	Rocks and Minerals: Documents that Record Earths History (minerals and their properties, minerals that form rocks)	Chapter 4: 47 - 55
6	Feb 2	Rocks and Minerals: Documents that Record Earths History (Earths three great rock families and how they are formed)	Chapter 4: 55 - 75

	4	TEST 1	
7	6	The Sedimentary Archives (Depositional Environments)	Chapter 5: 77 - 98
8	9	The Sedimentary Archives (Rock Units)	Chapter 5: 98 - 117
9	11	Life on Earth: What do Fossils Reveal?	Chapter 6: 119 - 128
10	13	Life on Earth: What do Fossils Reveal? (Life Evolution)	Chapter 6: 128 - 139
11	16	Life on Earth: What do Fossils Reveal? (Fossils and Stratigraphy)	Chapter 6: 139 - 159
12	18	Plate Tectonics Underlies All Earth History (Seismic Waves, Earths Internal Zones, Crust, Geologic Structures)	Chapter 7: 161 - 174
13	20	Plate Tectonics Underlies All Earth History (Drifting Continents)	Chapter 7: 174 - 205
	23 - 25	<i>Mardi Gras Holidays, no classes</i>	
	27	TEST 2	
14	March 2	Earliest Earth: 2,100,000,000 Years of the Archean Eon (The Origin of the Universe and the Solar System)	Chapter 8: 207 – 222
15	4	Earliest Earth: 2,100,000,000 Years of the Archean Eon (The Primitive Atmosphere and Ocean, Origin of Precambrian Rocks)	Chapter 8: 222 – 230
16	6	Earliest Earth: 2,100,000,000 Years of the Archean Eon (The origin of life)	Chapter 8: 230 - 241
17	9	The Proterozoic: Dawn of a More Modern World	Chapter 9: 243 - 255
18	11	The Proterozoic: Dawn of a More Modern World (Proterozoic Life)	Chapter 9: 255 - 265
19	13	Early Paleozoic Events	Chapter 10: 267 - 278
20	16	Early Paleozoic Events	Chapter 10: 278 - 293
21	18	Late Paleozoic Events	Chapter 11: 295 - 306
22	20	Late Paleozoic Events	Chapter 11: 306 - 325
		TEST 3	
	23-27	<i>AAG Conference, no classes</i>	
23	30	Life of the Paleozoic (Invertebrates)	Chapter 12: 327 - 353
24	April 1	Life of the Paleozoic (Vertebrates and Plants)	Chapter 12: 353 - 371
25	3	Mesozoic Events I	Chapter 13: 373 - 403
26	6	Mesozoic Events II	Chapter 13: 373 - 403
27	8	Life of the Mesozoic (Invertebrates, Vertebrates and Dinosaurs)	Chapter 14: 405 - 437
	9-17	<i>Spring Break and Easter Holidays, no classes</i>	
28	20	Movie	
29	22	Life of the Mesozoic (Birds, Mammals and Plants)	Chapter 14: 437 - 449
	24	TEST 4	
30	27	Cenozoic Events	Chapter 15: 451 - 485
31	29	Global Climate and Glacials	Chapter 15: 480 – 483, Lecture
32	May 1	Life of the Cenozoic	Chapter 16: 487 - 523
33	4	Human Origins I	Chapter 17: 525 - 547
34	6	Human Origins II	Chapter 17, Movie
	May 14	FINAL EXAM	1:00 - 3:00 PM